

**WHAT IS CLAIMED IS:**

1. An electro-conductive roll that makes contact with a body to be charged in a state in which a voltage is applied to the roll, and charges the body to be charged, wherein a surface of the electro-conductive roll satisfies the following conditions (a) and (b):

(a) the surface of the electro-conductive roll has a 10-point average roughness of 5  $\mu\text{m}$  or less; and

(b) the surface of the electro-conductive roll has a dynamic ultra-microhardness in the range of 0.04 to 0.5.

2. An electro-conductive roll according to claim 1, wherein the electro-conductive roll includes, on an electro-conductive substrate, at least two electro-conductive layers comprised of at least an electro-conductive elastic layer and an electro-conductive surface layer, and the electro-conductive elastic layer and the electro-conductive surface layer satisfy the following relationship (c):

(c)  $(R_z \text{ of a surface of the electro-conductive elastic layer}) \times 0.5 \leq \text{thickness of the electro-conductive surface layer} \leq (R_z \text{ of a surface of the elastic layer}) \times 2$ .

3. An electro-conductive roll according to claim 2, wherein the electro-conductive elastic layer is formed by dispersing an electro-conductive agent in at least one type of rubber material selected from the group consisting of isoprene rubber, chloroprene rubber, epichlorohydrin rubber, butyl rubber, urethane rubber, silicone

rubber, fluorine rubber, styrene-butadiene rubber, butadiene rubber, nitrile rubber, ethylene-propylene rubber, epichlorohydrin-ethylene oxide copolymer rubber, epichlorohydrin-ethylene oxide-allylglycidyl ether copolymer rubber, ethylene-propylene-diene ternary copolymer rubber (EPDM), acrylonitrile-butadiene copolymer rubber, natural rubber, and blended rubbers thereof.

4. An electro-conductive roll according to claim 3, wherein said electro-conductive agent is at least one type of electro-conductive material selected from the group consisting of fine grains of an electronic conductive agent, and an ionic conductive agent.

5. An electro-conductive roll according to claim 4, wherein the electro-conductive elastic layer is an elastic layer that includes the electronic conductive agent in the range of 1 to 30 parts by mass with respect to 100 parts by mass of the rubber material, or an electro-conductive elastic layer that includes the ionic conductive agent in the range of 0.1 to 5.0 parts by mass with respect to 100 parts by mass of the rubber material.

6. An electro-conductive roll according to claim 2, wherein the surface layer includes at least one type of polymer material selected from the group consisting of polyamide, polyurethane, polyvinylidene fluoride, ethylene tetrafluoride copolymer, polyester, polyimide, silicone resin, acrylic resin, polyvinyl butyral, ethylene

tetrafluoroethylene copolymer, melamine resin, fluoro rubber, epoxy resin, polycarbonate, polyvinyl alcohol, cellulose, polyvinylidene chloride, polyvinyl chloride, polyethylene, and ethylene-vinyl acetate copolymer.

7. An electro-conductive roll according to claim 6, wherein the surface layer includes at least one type of electrically conductive material selected from the group consisting of fine grains of an electronic conductive agent, and an ionic conductive agent.

8. An electro-conductive roll according to claim 7, wherein the surface layer is formed by application of a resin solution.

9. An electro-conductive roll according to claim 1, wherein the electro-conductive roll is a charging roll.

10. An electro-conductive roll according to claim 7, wherein the electro-conductive roll is a charging roll.

11. An electro-conductive roll according to claim 1, wherein the electro-conductive roll is a transfer roll.

12. An electro-conductive roll according to claim 7, wherein the electro-conductive roll is a transfer roll.

13. An electro-conductive roll according to claim 1, wherein the electro-conductive roll is a cleaning roll.

14. An electro-conductive roll according to claim 7, wherein the electro-conductive roll is a cleaning roll.

15. An electro-conductive roll according to claim 1, wherein the electro-conductive roll includes, on an electro-conductive substrate, two or more electro-conductive layers comprised of at least an electro-conductive elastic layer and an electro-conductive surface layer, and the electro-conductive elastic layer and the electro-conductive surface layer satisfy the following conditions (d) and (e):  
(d) a surface of the electro-conductive elastic layer has an  $R_z$  of 5  $\mu\text{m}$  or less; and  
(e) the electro-conductive surface layer has a film thickness of 3  $\mu\text{m}$  to 15  $\mu\text{m}$ .

16. An electro-conductive roll according to claim 15, wherein the electro-conductive elastic layer is formed by dispersing an electrically conductive agent in at least one type of rubber material selected from the group consisting of isoprene rubber, chloroprene rubber, epichlorohydrin rubber, butyl rubber, urethane rubber, silicone rubber, fluorine rubber, styrene-butadiene rubber, butadiene rubber, nitrile rubber, ethylene-propylene rubber, epichlorohydrin-ethylene oxide copolymer rubber, epichlorohydrin-ethylene oxide-allylglycidyl

ether copolymer rubber, ethylene-propylene-diene ternary copolymer rubber (EPDM), acrylonitrile-butadiene copolymer rubber, natural rubber, and blended rubbers thereof.

17. An electro-conductive roll according to claim 16, wherein the electro-conductive agent is at least one type of electro-conductive material selected from the group consisting of fine grains of an electronic conductive agent, and an ionic conductive agent.

18. An electro-conductive roll according to claim 15, wherein the electro-conductive surface layer includes at least one type of polymer material selected from the group consisting of polyamide, polyurethane, polyvinylidene fluoride, ethylene tetrafluoride copolymer, polyester, polyimide, silicone resin, acrylic resin, polyvinyl butyral, ethylene tetrafluoroethylene copolymer, melamine resin, fluoro rubber, epoxy resin, polycarbonate, polyvinyl alcohol, cellulose, polyvinylidene chloride, polyvinyl chloride, polyethylene, and ethylene-vinyl acetate copolymer.

19. An electro-conductive roll according to claim 18, wherein the electro-conductive surface layer is formed by application of a resin solution.

20. An image-forming apparatus comprising:  
a photoreceptor;

a charging device that charges the photoreceptor;  
an exposure device that exposes the charged photoreceptor  
and forms an electrostatic latent image;

a developing device that develops the electrostatic latent  
image with a toner; and

a transfer device that transfers a toner image to a receiving  
medium,

wherein the charging device, in a state where voltage is applied  
thereto, comes in contact with the photoreceptor, and comprises an  
electro-conductive roll that charges the photoreceptor, wherein a  
surface of the electro-conductive roll satisfies the following conditions

(a) and (b):

(a) the surface of the electro-conductive roll has a 10-point average  
roughness (Rz) of 5  $\mu\text{m}$  or less; and

(b) the surface of the electro-conductive roll has a dynamic ultra-  
microhardness in the range of 0.04 to 0.5.